STA-RITE®

MAX-E-GLAS II™ and DURA-GLAS II™ CENTRIFUGAL PUMPS WITH INTEGRAL TRAP

OWNER'S MANUAL

INSTALLATION, OPERATION & PARTS

Series P4E, P4EA, P4R, and P4RA

See Page 2 for Model Numbers

This manual should be furnished to the end user of this pump; its use will reduce service calls and chance of injury and will lengthen pump life.

Sta-Rite Pool/Spa Group

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Printed in U.S.A.

S454 (Rev. 12/5/02)

'P4R' and 'P4E' SERIES II PUMP WITH TRAP

To avoid unneeded service calls, prevent possible injuries, and get the most out of your pump, READ THIS MANUAL CAREFULLY!

The Sta-Rite 'P4R' and 'P4E' Series II Self-priming Centrifugal pumps:

- **Are designed for use with swimming pools or as centrifugal pumps.**
- **Are excellent performers; durable, reliable.**

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Max-E-Glas II™					
HP					
3/4	P4E6D-186L		P4E62D-186L	P4E6D-186LV	
1	P4E6E-187L	P4EA6E-186L	P4E62E-187L	P4E6E-187LV	
1-1/2	P4E6F-188L	P4EA6F-187L	P4E62F-188L	P4E6F-188LV	
1-3/4		P4EAA6F-198L			
2	P4E6G-189L	P4EA6G-188L	P4E62G-189L	P4E6G36-189	P4E6SSG36-189
2				P4E6G-189LV	P4EA6G-188LV
2-1/2		P4EAA6G-189L			
3				P4E6H-190LV	
3	P4E6H-190L		P4E62H-190L	P4E6H36-190	P4E6SSH36-190
Dura-Glas II™					
HP					
3/4	P4R62D3-186				P4R6D3-186
1	P4R62E3-187	P4R6E-187L	P4RA6E-186L		P4R6E3-187
1-1/2	P4R62F3-188	P4R6F-188L	P4RA6F-187L	P4RA6YF-187L	P4R6F3-188
1-3/4			P4RAA6F-198L		
2	P4R62G3-189	P4R6G-189L	P4RA6G-188L		P4R6G3-189
2-1/2			P4RAA6G-189L	P4RA6YG-188L	
3					P4R6H3-190

IMPORTANT SAFETY INSTRUCTIONS

Always follow basic safety precautions with this equipment, including the following.

⚠WARNING To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.

⚠ CAUTION This pump is for use with permanently installed pools and may also be used with hot tubs and spas if so marked. Do not use with storable pools. A permanently installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storable pool is constructed so that it may be readily disassembled for storage and reassembled to its original integrity.

SAVE THESE INSTRUCTIONS

READ AND FOLLOW SAFETY INSTRUCTIONS!

⚠ This is the safety alert symbol. When you see this symbol on your system or in this manual, look for one of the following signal words and be alert to the potential for personal injury.

⚠ DANGER warns about hazards that **will** cause death, serious personal injury, or major property damage if ignored.

⚠WARNING warns about hazards that **can** cause death, serious personal injury, or major property damage if ignored.

⚠ CAUTION warns about hazards that **will** or **can** cause minor personal injury or property damage if ignored.

NOTICE indicates special instructions not related to hazards.

Carefully read and follow all safety instructions in this manual and on equipment. Keep safety labels in good condition; replace if missing or damaged.

⚠WARNING
Hazardous pressure

Incorrectly installed or tested equipment may fail, causing severe injury or property damage.
Read and follow instructions in owner's manual when installing and operating equipment. Have a trained pool professional perform all pressure tests.

1. Do not connect system to a high pressure or city water system.
2. Use equipment only in a pool or spa installation.
3. Install pump with at least 2 hydraulically balanced main drains equipped with correctly installed, screw-fastened, anti-entrapment certified covers. See Page 5.
4. Trapped air in system can cause explosion. BE SURE all air is out of system before operating or testing equipment.

Before pressure testing, make the following safety checks:

- Check all clamps, bolts, lids, and system accessories before testing.
- Release all air in system before testing.
- Tighten Sta-Rite trap lids to 30 ft. lbs. (4.1 kg-m) torque for testing.
- Water pressure for test must be less than 25 PSI (7.5 kg/cm^2).
- Water Temperature for test must be less than 100^o F. (38^o C).
- Limit test to 24 hours. After test, visually check system to be sure it is ready for operation. Remove trap lid and retighten hand tight only.

  NOTICE: These parameters apply to Sta-Rite equipment only. For non-Sta-Rite equipment, consult manufacturer.

INSTALLATION

Only qualified, licensed personnel should install pump and wiring.

Pump mount must:

Be located away from corrosive or flammable chemicals.

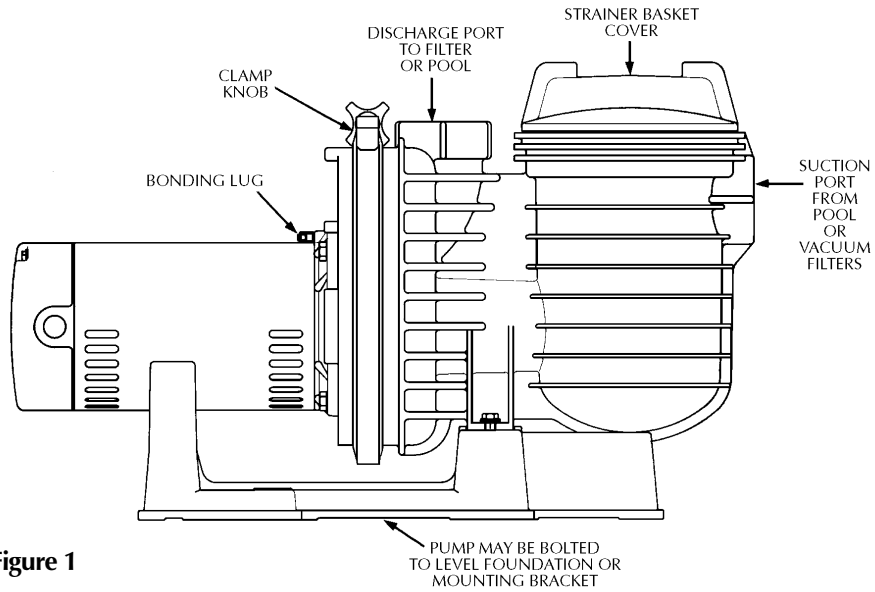

STRAINER BASKET COVER
DISCHARGE PORT TO FILTER OR POOL
CLAMP KNOB
BONDING LUG
SUCTION PORT FROM POOL OR VACUUM FILTERS
PUMP MAY BE BOLTED TO LEVEL FOUNDATION OR MOUNTING BRACKET

Figure 1

Have enough ventilation to maintain air temperature at less than the maximum ambient temperature rating (Max. Amb.) listed on the motor model plate. If this pump is installed in an enclosure/pump house, the enclosure must have adequate ventilation and air circulation to keep the temperature in the enclosure at or below the motor's rated ambient temperature whenever the pump is running.

Be solid - Level - Rigid - Vibration free - Non-combustible. (To reduce vibration and pipe stress, bolt pump to mount.)

Allow pump suction inlet height to be as close to water level as possible.

Allow use of short, direct suction pipe (To reduce friction losses).

Allow for gate valves in suction and discharge piping.

Have adequate floor drainage to prevent flooding.

Be protected from excess moisture.

Allow adequate access for servicing pump and piping.

⚠WARNING **Fire and burn hazard.** Modern motors run at high temperatures. To reduce the risk of fire, do not allow leaves, debris, or foreign matter to collect around the pump motor. To avoid burns when handling the motor, let it cool for 20 minutes before trying to work on it.

NOTICE: Use Teflon tape or Plasto-Joint Stik[1] for making all threaded connections to the pump. Do not use pipe dope; pipe dope will cause stress cracking in the pump.

NOTICE: Pump suction and discharge connections have molded in thread stops. DO NOT try to screw pipe in beyond these stops.

Teflon Taping Instructions:

Use only new or clean PVC pipe fittings.

Wrap male pipe threads with one to two layers of Teflon tape. Cover entire threaded portion of pipe.

Do not overtighten or tighten past thread stop in pump port!

If leaks occur, remove pipe, clean off old tape, rewrap with one to two additional layers of tape and remake the connection.

NOTICE: Support all piping connected with pump!

[1]Lake Chemical Co., Chicago, Illinois

Piping:

Use at least 2" IPS PVC (51mm) pipe. Increase size if a long run is needed.
To avoid strains on the pump, support both suction and discharge pipes independently. Place these supports near the pump.
To avoid a strain left by a gap at the last connection, start all piping at the pump and run pipe **away** from the pump.
Never use a suction pipe smaller than pump suction connection.
To avoid airlocking, slope suction pipe slightly upward toward the pump.
NOTICE: To prevent flooding when removing pump for service, all flooded suction systems **must** have gate valves in suction and discharge pipes.

Fittings:

Fittings restrict flow; for best efficiency use fewest possible fittings.
Avoid fittings which could cause an air trap.
Pool fittings must conform to International Association of Plumbing and Mechanical Officials (IAPMO) standards.
Use only non-entrapping suction fitting or double suction.

POOL PUMP SUCTION REQUIREMENTS

⚠WARNING Pump suction is hazardous and can trap and drown or disembowel bathers. Do not use or operate swimming pools, spas, or hot tubs if a suction outlet cover is missing, broken, or loose. Follow the guidelines below for a pump installation which minimizes risk to users of pools, spas, and hot tubs.

Entrapment Protection

The pump suction system *must* provide protection against the hazard of suction entrapment or hair entrapment/entanglement.

Suction Outlet Covers

All suction outlet covers must be maintained. They must be replaced if cracked, broken, or missing.
See below for outlet cover certification requirements.
All suction outlets must have correctly installed, screw-fastened covers in place.

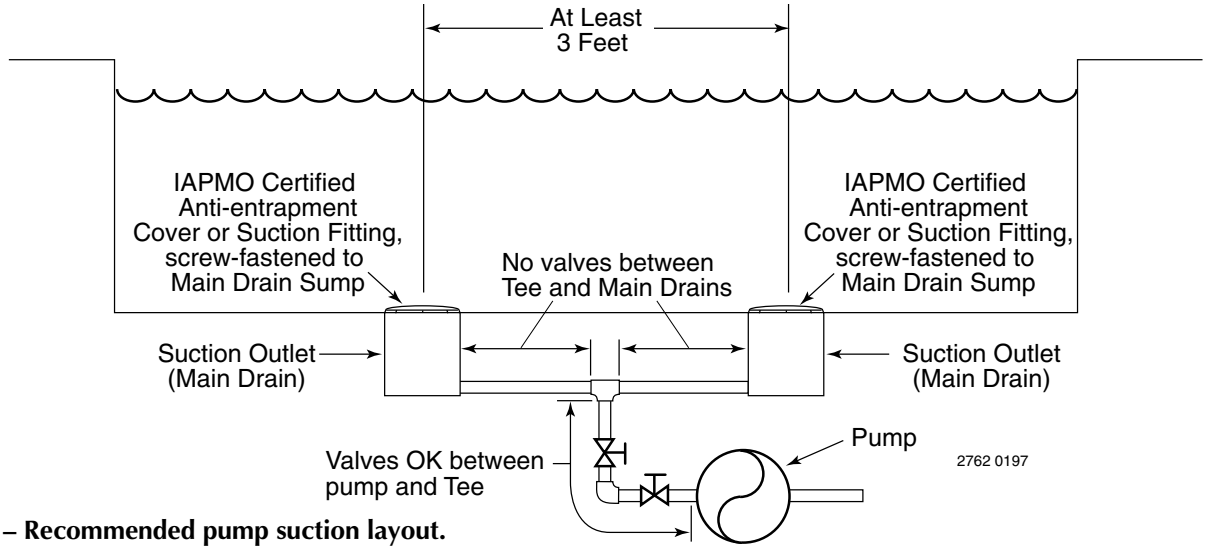


Figure 2 – Recommended pump suction layout.

Testing and Certification

Suction outlet covers must have been tested by a nationally recognized testing laboratory and found to comply with the latest ASME/ANSI Specification for *Suction Fittings For Use in Swimming Pools, Spas, Hot Tubs, and Whirlpool Bathtub Applications.*

Outlets Per Pump

Provide at least two hydraulically balanced main drains, with covers (see Page 5), for each swimming pool pump suction line. The centers of the main drains (suction fittings) must be at least three feet apart.

The system must be built so that it cannot operate with the pump drawing water from only *one* main drain (that is, there must be at least two main drains connected to the pump whenever it is running). (See Figure 2). However, if two main drains run into a single suction line, the single suction line may be equipped with a valve which will shutoff *both* main drains from the pump (see Figure 2).

More than one pump can be connected to a single suction line as long as the requirements above are met.

NOTICE: 3 phase models require magnetic motor starters and external overload protection.
If in doubt about the procedure, consult a licensed electrician.

Water Velocity

The maximum water velocity through any suction outlet must be 1.5 feet per second unless the outlet complies with the latest ASME/SNSI Specification for *Suction Fittings For Use in Swimming Pools, Spas, Hot Tubs, and Whirlpool Bathtub Applications.* In any case, do not exceed the suction fittings maximum designed flow rate.

If 100% of the pump's flow comes from the main drain system, the maximum water velocity in the pump suction hydraulic system must be six feet per second or less even if one main drain (suction fitting) is completely blocked. The flow through the remaining main drain(s) must comply with the latest ASME/ANSI Specification for *Suction Fittings For Use in Swimming Pools, Spas, Hot Tubs, and Whirlpool Bathtub Applications.*

ELECTRICAL

⚠ Ground motor before connecting to electrical power supply. Failure to ground motor can cause severe or fatal electrical shock hazard.

⚠ Do not ground to a gas supply line.

⚠ To avoid dangerous or fatal electrical shock, turn OFF power to motor before working on electrical connections.

⚠ Ground Fault Circuit Interrupter (GFCI) tripping indicates an electrical problem. If GFCI trips and will not reset, have a qualified electrician inspect and repair electrical system.

⚠ Exactly match supply voltage to nameplate voltage. Incorrect voltage can cause fire or seriously damage motor and voids warranty. If in doubt consult a licensed electrician.

⚠ WARNING

Hazardous voltage. Can shock, burn, or cause death.

Ground pump before connecting to power supply.

Voltage

Voltage at motor must be not more than 10% above or below motor nameplate rated voltage or motor may overheat, causing overload tripping and reduced component life. If voltage is less than 90% or more than 110% of rated voltage when motor is running at full load, consult power company.

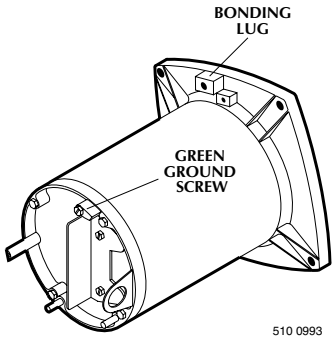


Figure 3: Typical ground screw and bonding lug locations.

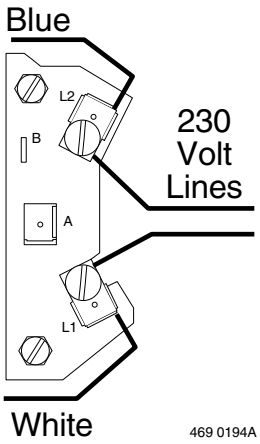


Figure 4A: Single-phase, single speed wiring connection diagram. For 3-phase connection, refer to motor nameplate.

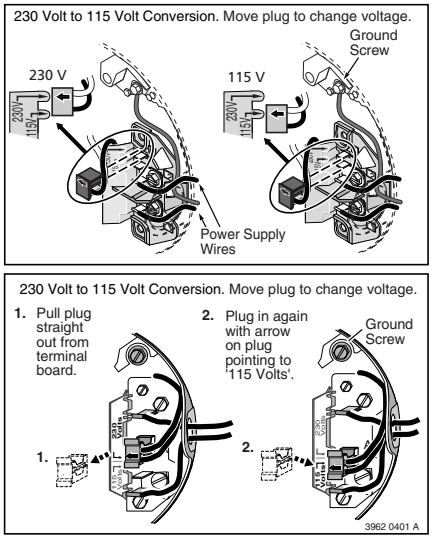

230 Volt to 115 Volt Conversion. Move plug to change voltage.
230 V
115 V
Ground Screw
Power Supply Wires
230 Volt to 115 Volt Conversion. Move plug to change voltage.
1. Pull plug straight out from terminal board.
2. Plug in again with arrow on plug pointing to '115 Volts'.
Ground Screw
3962 0401 A

Figure 4B: Wiring connections for plug-in type terminal board (Single speed, single phase motors)

Grounding/Bonding

Install, ground, bond and wire motor according to local or National Electrical Code requirements.

Permanently ground motor. Use green ground terminal provided under motor canopy or access plate (See Figure 3); use size and type wire required by code. Connect motor ground terminal to electrical service ground.

Bond motor to pool structure. Use a solid copper conductor, size No. 8 AWG (8.4 sq.mm) or larger. Run wire from external bonding lug (see Figure 3) to reinforcing rod or mesh.

Connect a No. 8 AWG (8.4 sq.mm) solid copper bonding wire to the pressure wire connector provided on the motor housing and to all metal parts of the swimming pool, spa, or hot tub and to all electrical equipment, metal piping or conduit within 5 feet (1.5 m) of the inside walls of swimming pool, spa, or hot tub.

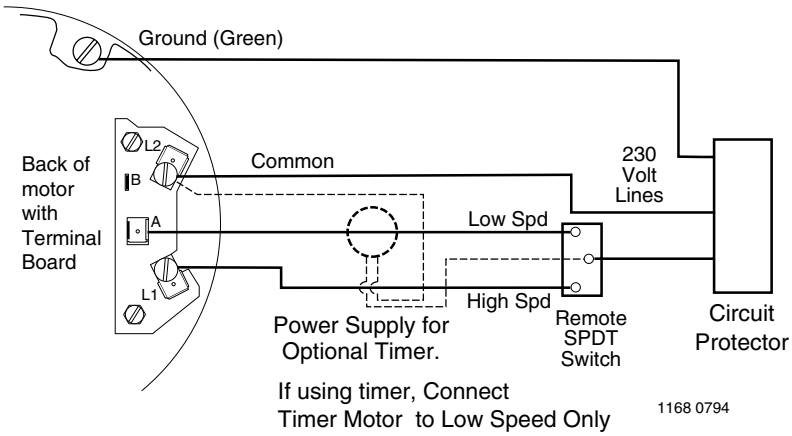
Wiring

Pump must be permanently connected to circuit. See Figures 4A, 4B, and 4C for wiring connection diagrams. Match wire and circuit breaker sizes to correct Fusing and Wiring Data Chart (Page 8). If other lights or appliances are also on the same circuit, be sure to add their amp loads to pump amp load. (If unsure how to do this or if this is confusing, consult a licensed electrician.) Use the load circuit breaker as the master on-off switch.

Install a Ground Fault Circuit Interrupter (GFCI) in circuit; it will sense a short-circuit to ground and disconnect power before it becomes dangerous to pool users. For size of GFCI required and test procedures for GFCI, see manufacturer's instructions.

In case of power outage, check GFCI for tripping (which will prevent normal water circulation). Reset if necessary.

NOTICE: If you do not use conduit when wiring motor, **be sure** to seal wire opening on end of motor to prevent dirt, bugs, etc., from entering motor.



Minimum switch and timer amp rating must equal Branch Fuse Rating given in "Recommended Fusing and Wiring Data" table.

Figure 4C: Single-phase, 2-speed wiring hookup diagram (Models P4RA6YF-187L and P4RA6YG-188L).

TABLE I - RECOMMENDED FUSING AND WIRING DATA – P4E, P4EA MODELS

Motor HP	Branch Fuse Rating Amps*	Max Load Amps	Voltage/ Hz/Phase	Serv. to Motor - Dist. in Ft. (M) 0-100' (0-30 M)	101-200' (30-60 M)	201-300' (60-90 M)	
P4E Models:							
3/4	20	13.8	115/60/1	12(3)	10(5.5)	8(8.4)	
1	25	16.0	115/60/1	12(3)	8(8.4)	6(14)	
1	15	8.0	230/60/1	14(2)	14(2)	14(2)	Wire Size AWG (mm²)
1-1/2	15	10.4	230/60/1	14(2)	12(3)	12(3)	
2	15	11.2	230/60/1	14(2)	12(3)	12(3)	
2	15	1.5	575/60/3	14(2)	14(2)	14(2)	
3	15	3.4	575/60/3	14(2)	14(2)	14(2)	
3	25	15.8	230/60/1	12(3)	12(3)	10(5.5)	
P4EA Models:							
1	20	13.8	115/60/1	12(3)	10(5.5)	8(8.4)	
1-1/2	25	16.0	115/60/1	12(3)	8(8.4)	6(14)	
1	15	6.9	230/60/1	14(2)	14(2)	14(2)	Wire Size AWG (mm²)
1-1/2	15	8.0	230/60/1	14(2)	14(2)	12(3)	
1-3/4	15	10.4	230/60/1	14(2)	12(3)	12(3)	
2	15	10.4	230/60/1	14(2)	12(3)	12(3)	
2-1/2	15	11.2	230/60/1	14(2)	12(3)	12(3)	
P4E62 Models:							
3/4	20	13.4	100/60/1	14(2)	12(3)	8(8.4)	
3/4	15	6.7	200/60/1	14(2)	14(2)	14(2)	Wire Size AWG (mm²)
1	15	7.4	200/60/1	14(2)	14(2)	12(3)	
1-1/2	15	10.5	200/60/1	14(2)	12(3)	12(3)	
2	20	14.2	200/60/1	12(3)	12(3)	10(5.5)	
3	25	17.6	200/60/1	10(5.5)	10(5.5)	10(5.5)	

* Time delay fuses are recommended instead of standard fuses in any motor circuit.

TABLE II - RECOMMENDED FUSING AND WIRING DATA – P4R, P4RA MODELS

Motor HP	Branch Fuse Rating Amps*	Max Load Amps	Voltage/ Hz/Phase	Serv. to Motor - Dist. in Ft. (M) 0-100' (0-30 M)	101-200' (30-60 M)	201-300' (60-90 M)	
P4R Models:							
1	30	19.2	115/60/1	10(5.5)	8(8.4)	6(14)	Wire Size AWG (mm²)
1	15	9.6	230/60/1	14(2)	14(2)	12(3)	
1-1/2	15	12.0	230/60/1	14(2)	14(2)	12(3)	
2	15	11.2	230/60/1	14(2)	14(2)	12(3)	
P4RA Models:							
1	20/15	15.3/7.6	115/230/60/1	12/14(3/2)	8/14(8.4/2)	6/14(14/2)	
1-1/2	30	19.2	115/60/1	10(5.5)	8(8.4)	6(14)	Wire Size AWG (mm²)
1-1/2	15	9.6	230/60/1	14(2)	14(2)	12(3)	
1-3/4	15	12.0	230/60/1	14(2)	14(2)	12(3)	
2	15	12.0	230/60/1	14(2)	14(2)	12(3)	
2-1/2	15	11.2	230/60/1	14(2)	14(2)	12(3)	
P4RA 2-Speed Models:							
1-1/2 - 1/4	15	9.2/2.5	230/60/1	14(2)	14(2)	12(3)	Wire Size AWG (mm²)
2 - 1/3	15	10.2/3.7	230/60/1	14(2)	14(2)	12(3)	
P4R62 Models:							
3/4	15	3.8	200/60/3	14(2)	14(2)	14(2)	Wire Size AWG (mm²)
1	15	5.6	200/60/3	14(2)	14(2)	14(2)	
1-1/2	15	6.6	200/60/3	14(2)	14(2)	14(2)	
2	15	9.8	200/60/3	14(2)	14(2)	14(2)	
P4R6 3-Phase Models:							
3/4	15/15	3.6/1.8	230/460/60/3	14(2)	14(2)	14(2)	Wire Size AWG (mm²)
1	15/15	4.7/2.35	230/460/60/3	14(2)	14(2)	14(2)	
1-1/2	15/15	5.8/2.9	230/460/60/3	14(2)	14(2)	14(2)	
2	15/15	7.0/3.5	230/460/60/3	14(2)	14(2)	14(2)	
2-1/2	15/15	9.7/4.9	230/460/60/3	14(2)	14(2)	12(3)/14(2)	
3	15/15	11.5/5.8	230/460/60/3	14(2)	14(2)	12(3)/14(2)	

* Time delay fuses are recommended instead of standard fuses in any motor circuit.

OPERATION

⚠ NEVER run pump dry. Running pump dry may damage seals, causing leakage and flooding. Fill pump with water before starting motor.

⚠ CAUTION

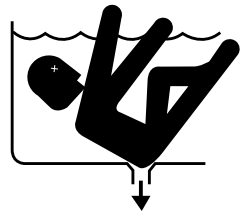
⚠ Before removing trap cover:

1. STOP PUMP before proceeding.
2. CLOSE GATE VALVES in suction and discharge pipes.
3. RELEASE ALL PRESSURE from pump and piping system.
4. NEVER tighten or loosen clamp while pump is operating!

⚠ If pump is being pressure tested, be sure pressure has been released before removing trap cover.

⚠ Do not block pump suction. To do so with body may cause severe or fatal injury. Small children using pool must ALWAYS have close adult supervision.

⚠WARNING



Hazardous suction. Can trap hair or body parts, causing severe injury or death.

Do not block suction.

⚠WARNING Fire and burn hazard. Modern motors run at high temperatures. To reduce the risk of fire, do not allow leaves, debris, or foreign matter to collect around the pump motor. To avoid burns when handling the motor, let it cool for 20 minutes before trying to work on it. An automatic internal cutoff switch protects the motor from heat damage during operation.

NOTICE: Maximum ambient temperature for motor operation must not exceed maximum ambient temperature rating on motor model plate.

Priming Pump

Release all pressure from filter, pump, and piping system; see the filter owner's manual.

In a flooded suction system (water source higher than pump), pump will prime itself when suction and discharge valves are opened.

If pump is not in a flooded suction system, unscrew and remove trap cover; fill trap and pump with water.

Do not lubricate the trap cover O-Ring. The original equipment O-Ring contains a permanent internal lubricant.

NOTICE: If you replace the O-Ring with a non-internally lubricated O-Ring, you may need to apply a silicone based lubricant.

Clean and inspect O-Ring; reinstall on trap cover.

Replace trap cover on trap; turn clockwise to tighten cover.
NOTICE: Tighten trap cover by hand only **(no wrenches)!** Use a wrench only if necessary to remove lid!
Pump should prime now. Priming time will depend on vertical length of suction lift and horizontal length of suction piping.

If pump does not prime, make sure that all valves are open, suction pipe end is under water, and that there are no leaks in suction pipe.

See Troubleshooting Guide, Page 13.

Routine Maintenance

The only routine maintenance needed is inspection/cleaning of trap basket. Debris or trash that collects in basket will choke off water flow through the pump. Follow instructions below to clean trap:

1. Stop pump, close valves in suction and discharge, and **release all pressure from system before proceeding.**
2. Unscrew trap lid (turn counterclockwise). If necessary, use a lever such as a board or long screwdriver between lugs on trap cover.

3. Remove strainer basket and clean. Be sure all holes in basket are clear, flush basket with water and replace in trap with large opening at pipe connection port (between ribs provided). If basket is replaced backwards cover will not fit on trap body.
4. Clean and inspect lid O-Ring; reinstall on trap cover.
5. Clean O-Ring groove on trap body and replace lid. To help keep lid from sticking, tighten **hand tight only (no wrenches!)**.
6. Prime pump (see priming instructions).

Draining Pump

1. Pump down water level below all inlets to the pool.

⚠ **To avoid dangerous or fatal electrical shock hazard, turn OFF power to motor before draining pump.**

2. Remove trap cover and use low pressure air to blow accumulated water from the piping system. Lugs have been provided on the trap lid to use a lever or pry bar for loosening.
3. Cap inlet piping after draining to keep water out of the pipes.
4. To prevent pump from freezing, remove trap cover and drain the tank body through the drain plugs (Key No. 19, Pages 14 - 18). Clean pump and trap basket thoroughly; replace trap cover.
   NOTICE: Tighten trap cover by hand only **(no wrenches)!** Use a lever or wrench only if necessary to remove cover! If pump is not anchored, use caution not to break attached piping!
5. Be sure motor is kept dry and covered.

Storage/Winterizing:

⚠ WARNING **Explosion hazard. Purging the system with compressed air can cause components to explode, with risk of severe injury or death to anyone nearby.** Use only a low pressure (below 5 PSI), high volume blower when air purging the pump, filter, or piping.

NOTICE: Allowing pump to freeze will damage pump and void warranty!

NOTICE: Do not use anti-freeze solutions (except propylene glycol) in your pool/spa system. Propylene glycol is non-toxic and will not damage plastic system components; other anti-freezes are highly toxic and may damage plastic components in the system.

Drain all water from pump and piping when expecting freezing temperatures or when storing pump for a long time (see instructions below).

Keep motor dry and covered during storage.

To avoid condensation/corrosion problems, **do not** cover pump with plastic.

For outdoor/unprotected installations:

1. Gravity drain system as far as possible.
2. Protect areas which retain water with non-toxic propylene glycol antifreeze ("RV antifreeze").
3. Enclose entire system in a weatherproof enclosure.
4. To avoid condensation/corrosion damage, allow ventilation; **do not** wrap system in plastic.
5. Use a 40% propylene glycol/60% water solution to protect pump to -50°F (-46°C).

Startup For Winterized Equipment

1. Remove any temporary weather protection placed around system.
2. Follow filter manufacturer's instructions for reactivation of the filter.
3. Inspect all electrical wiring for damage or deterioration over the shutdown period. Have a qualified serviceman repair wiring as needed.
4. Inspect and tighten all watertight connections.
5. Open all valves in suction and return piping.
6. Remove any winterizing plugs in piping system.
7. Drain all antifreeze from system.
8. Close all drain valves and replace all drain plugs in piping system.
9. Prime pump according to instructions on Page 9.

PUMP SERVICE

Pump should only be serviced by qualified personnel.

For best results, use only genuine Sta-Rite factory parts.

Be sure to prime pump (Page 9) before starting.

⚠ CAUTION

⚠ **Before removing clamp or trap cover:**

1. STOP PUMP before proceeding.

2. CLOSE GATE VALVES in suction and discharge pipes.

3. RELEASE ALL PRESSURE from pump and piping system.

4. NEVER tighten or loosen clamp while pump is operating!

⚠ WARNING

Hazardous voltage. Can shock, burn, or cause death.

Disconnect power before working on pump or motor.

⚠ **To avoid dangerous or fatal electrical shock hazard, turn OFF power to motor before working on pump or motor.**

Aside from lubricating trap cover "O" Ring, no lubrication or regular maintenance is needed beyond reasonable care and periodic cleaning of strainer basket.

If shaft seal is worn or damaged, repair as follows:

Pump Disassembly/Removing Old Seal

Disconnect power to pump motor.

⚠ **Be sure** gate valves on suction and return piping are closed before starting work.

Release all pressure by opening all vents before starting work.

1. Drain pump by removing drain plugs on bottom of pump body and trap body.
2. **Be sure** there is no pressure in trap body; remove cover (unscrew by turning counterclockwise).
3. Remove clamp holding pump halves together. Motor and seal plate assembly can now be pulled away from pump body.
4. Remove five screws and washers holding diffuser to seal plate. Remove diffuser.
5. Remove motor canopy. Being careful not to touch capacitor terminals, loosen capacitor clamp and move capacitor to one side.
6. Hold shaft with 7/16" open-end wrench on motor shaft flats.

7. Unscrew impeller from shaft (turn counterclockwise when facing it).
   NOTICE: On models with impeller screw: Remove impeller screw (left hand thread - turn **clockwise**) and gasket before removing impeller. Inspect gasket for damage, cracks, etc. Replace if damaged.
8. Pull rotating member of seal off of impeller sleeve; clean sleeve.
9. Remove four screws holding seal plate to motor.
10. Place seal plate face down on flat surface and tap out ceramic seat.
11. Clean seal cavity in seal plate and clean motor shaft.

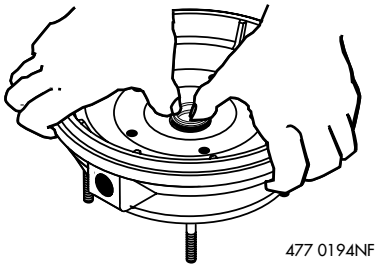


Figure 5: Press seal into heat sink in seal plate

Pump Reassembly/Installing New Seal

1. Ceramic seat must be clean and free of dirt, grease, dust, etc. Wet outer edge of rubber cup on ceramic seat with small amount of liquid detergent; press ceramic seat into seal plate insert firmly and squarely with finger pressure (Figure 5).
2. If ceramic seat will not locate properly, remove it, place **face up** on bench and reclean cavity. Ceramic seat should now locate.
3. If seat still will not locate properly, place a cardboard washer over the polished face and use a piece of 3/4" (19mm) standard pipe for pressing purposes. **NOTICE: Be sure** not to scratch or mar polished surface or seal will leak.
4. Remount seal plate on motor. Tighten bolts to 60-80 inch-lbs. (69-92 kg/cm) torque.
5. Apply a **small** amount of liquid detergent to inside diameter of rotating half of seal.
6. Slide rotating seal member, polished face last, over impeller sleeve until rubber drive ring hits shoulder.
   NOTICE: Be sure not to nick or scratch polished seal face; seal will leak if face is damaged.
7. Screw impeller onto shaft (clockwise); this will automatically locate seal in seal plate.
   NOTICE: On models with impeller screw: Install impeller gasket and lock screw (left-hand thread - turn **counterclockwise**). Torque lock screw to 50-55 inch-lbs. (57.6-63 kg/cm).
8. Mount diffuser on seal plate; tighten screws to 10-14 inch-lbs. (11.2-16.1 kg/cm) torque.
9. Assemble motor and seal plate to volute; be sure clamp is properly seated.

   NOTICE: Clamp knob can be located in any position around volute; if it is moved after assembly, tighten knob while tapping around clamp to assist sealing. Do not move clamp while pump is full of water.

   ⚠WARNING Hazardous pressure. Release all pressure from pump and piping system before working on pump or attempting to adjust or remove clamp. Clamp may blow off of pump if adjusted under pressure.
10. Prime pump according to instructions on Page 9.

TROUBLESHOOTING GUIDE

⚠ Read and understand safety and operating instructions in this manual before doing any work on pump!

⚠ Only qualified personnel should electrically test pump motor!

FAILURE TO PUMP; REDUCED CAPACITY OR DISCHARGE PRESSURE

Suction leaks/lost prime:

1. Pump must be primed; make sure that pump volute and trap are full of water. See priming instructions, Page 9.
2. Make sure there are no leaks in suction piping.
3. Make sure suction pipe inlet is well below the water level to prevent pump from sucking air.
4. Suction lift of 10 to 20 feet (3-6 M) will reduce performance. Suction lift of more than 20 feet (6 M) will prevent pumping and cause pump to lose prime. In either case, move pump closer (vertically) to water source. Make sure suction pipe is large enough.

Clogged pipe/trap/impeller, worn impeller:

5. Make sure suction trap is not clogged; if it is, clean trap and strainer.
6. Make sure impeller is not clogged (follow steps 1 through 7 under "Removing Old Seal", Page 11; check impeller for clogging; follow steps 7 through 10 under "Installing New Seal", Page 12, for reassembly).
7. Impeller and diffuser may be worn. If so, order replacement parts from Repair Parts List, Pages 14-18.
8. Pump may be trying to push too high a column of water. If so, a "higher head" pump is needed.

⚠ WARNING

Hazardous voltage. Can shock, burn, or cause death.

Disconnect power before working on pump or motor.

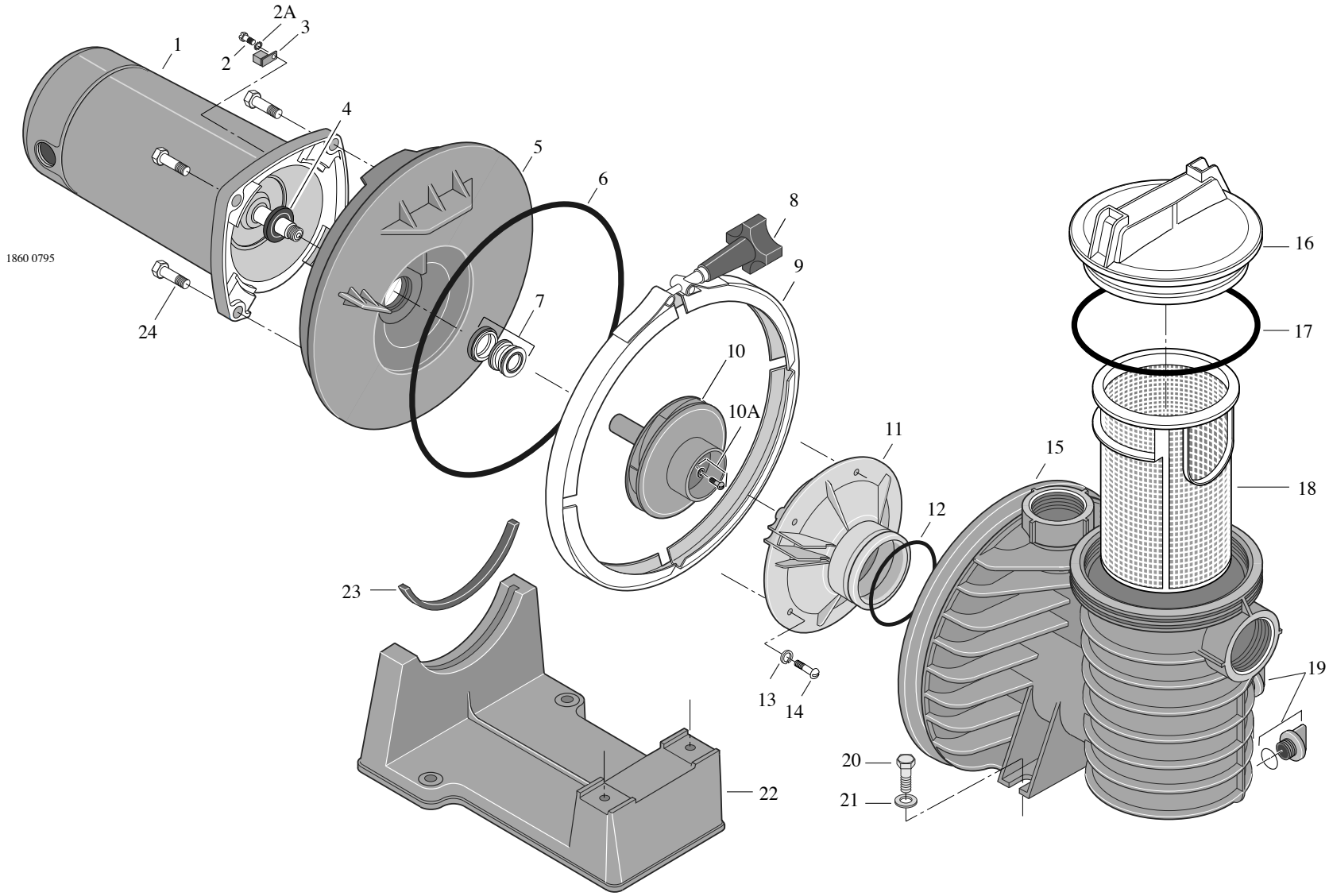
Electrical:

9. Pump may be running too slowly; check voltage at motor terminals and at meter while pump is running. If low, see wiring instructions or consult power company. Check for loose connections.
10. Pump may be too hot.
    - A. Check line voltage; if less than 90% or more than 110% of rated voltage consult a licensed electrician.
    - B. Increase ventilation.
    - C. Reduce ambient temperature.
    - D. Tighten any loose connections.

MECHANICAL TROUBLES AND NOISE

1. If suction and discharge piping are not adequately supported, pump assembly will be strained. See "Installation", Page 4.
2. Do not mount pump on a wooden platform! Securely mount on concrete platform for quietest performance.

P4E, P4EA and P4E62 SERIES
MAX-E-GLAS II POOL PUMP
3/4 through 3 HP Models



P4E, P4EA and P4E62 SERIES
MAX-E-GLAS II POOL PUMP
3/4 through 3 HP Models

Models with "LV" suffix are identical to corresponding models with "L" suffix except for the shaft seal, which is Viton equipped.

Parts are common to all models listed except as noted;
Key Nos. 1, Motor; 10, Impeller; and 11, Diffuser are listed below.

Model No.	HP	Motor No. (Key No. 1)	Impeller (Key No. 10)	Diffuser (Key No. 11)
115/230 Volt				
P4E6D-186L	3/4	AE100DHL	C105-238P	C1-271P1
P4E6E-187L	1	AE100EHL	C105-238PB	C1-271P1
P4EA6E-186L	1	AE100ELL	C105-238P	C1-271P1
P4EA6F-187L	1-1/2	AE100FLL	C105-238PB	C1-271P1
230 Volt				
P4E6F-188L*	1-1/2	AE100FHL	C105-238PDBA	C1-271P
P4EAA6F-198L*	1-3/4	AE100F5LL	C105-238PDCA	C1-271P
P4E6G-189L*	2	AE100GHL	C105-238PEBA	C1-271P
P4EA6G-188L*	2	AE100GLL	C105-238PDBA	C1-271P
P4EAA6G-189L*	2-1/2	AE100G5LL	C105-238PEBA	C1-271P
P4E6H-190L*	3	AE100HLL	C105-238PLA	C1-271P
100/200 Volt				
P4E62D-186L	3/4	AE100DH2	C105-238P	C1-271P1
200 Volt				
P4E62E-187L	1	AE100EH2	C105-238PB	C1-271P1
P4E62F-188L*	1-1/2	AE100FH2	C105-238PDBA	C1-271P
P4E62G-189L*	2	AE100GH2	C105-238PEBA	C1-271P
P4E62H-190L*	3	AE100GHL2	C105-238PLA	C1-271P
575 Volt				
P4E6G36-189*	2	62003-2087	C105-238PEBA	C1-271P
P4E6SSG36-189*	2	62003-2087	C105-238PEBA	C1-271PSS
P4E6H36-190*	3	62001-1021	C105-238PLA	C1-271P
P4E6SSH36-190*	3	62001-1021	C105-238PLA	C1-271PSS

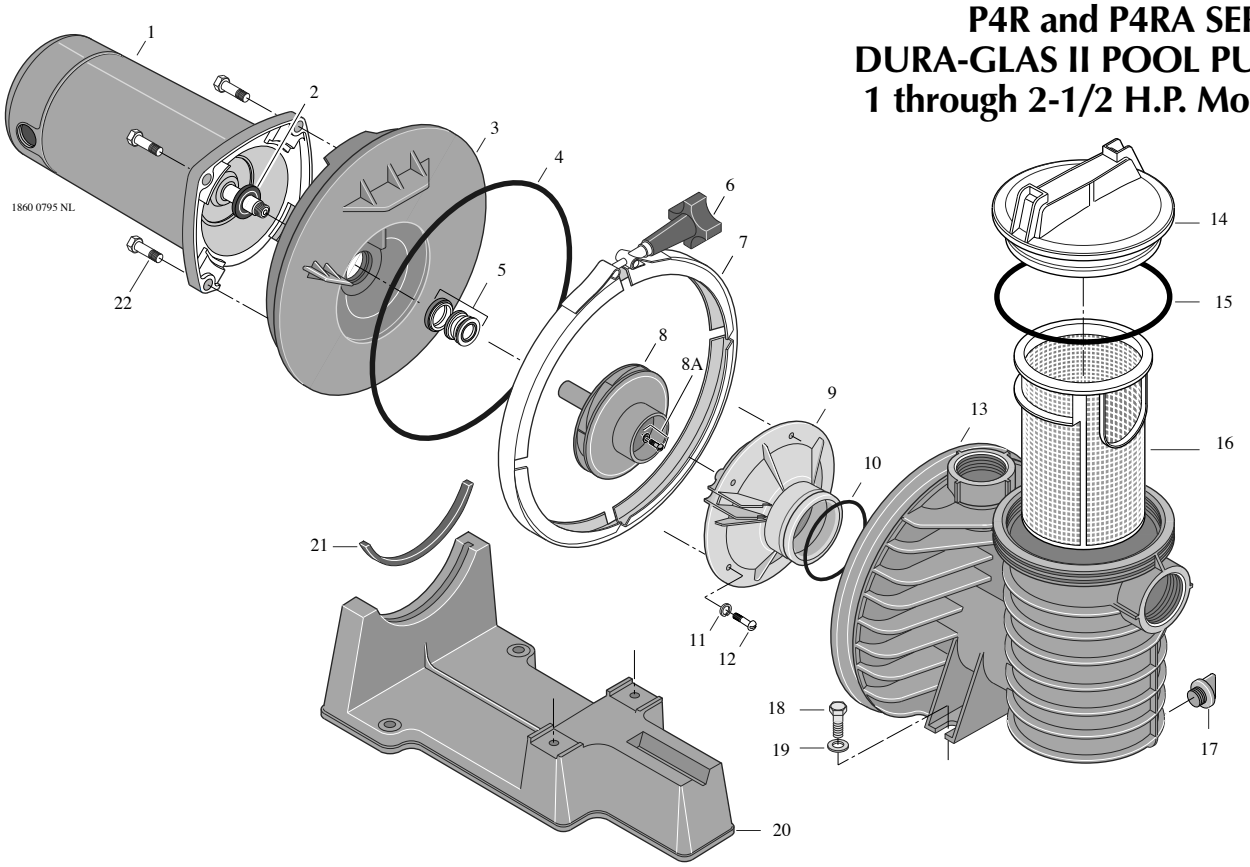
*Uses Impeller Screw No. 37337-6080. See Repair Parts List.

REPAIR PARTS LIST

Key No.	Part Description	Qty.	Part No.
1	Motor	1	Chart at Right
2	#10-32x1/2" Screw	1	U30-692SS
2A	Lock Washer	1	U43-22SS
3	Bonding Lug	1	U17-568
4	Water Slinger	1	17351-0009
5	Seal Plate Kit (Incl. Key Nos. 6, 7)#	1	C203-194P
6	O-Ring	1	U9-228A
7	Shaft Seal†	1	37400-0027S
8	Clamp Knob	1	C19-37A
9	Clamp	1	WC36-22
10	Impeller	1	Chart at Right
10A	Impeller Screw Assembly	1	17301-0151
11	Diffuser	1	Chart at Right
12	Diffuser O-Ring	1	U9-374
13	#8 Lock Washer	5	U43-21SS
14	Screw (w/C1-271P Diffuser)	5	U30-922SS
14	Screw (w/C1-271P1 Diffuser)	5	U30-542SS
15	Tank Body	1	C176-59P
16	Trap Cover	1	C3-185P
17	Trap O-Ring	1	U9-375
18	Basket	1	C8-58P
19	1/4" NPT Drain Plug	2	U178-920P
20	Base Screw	2	U30-918SS
21	Base Washer	2	U43-41SS
22	Base w/Motor Pad**	1	C104-78P
23	Motor Pad	1	C35-43
24	3/8-16x1" Hex Hd. Screw	4	U30-74SS
•	Voltage Sticker - 230 Volts (Single voltage models only)		U27-68
•	Voltage Sticker - 115/230 Volts (Dual voltage models only)		U27-153
•	Tag, "CAUTION, WARNING (bonding)"		61002-0002
•	Decal, "Do not overtighten..."		U27-644
•	Nameplate (P4E Series)		32155-4035
•	Nameplate (P4EA Series)		32155-4071

• Not illustrated.
** Models P4E6H and P4E62H use Base No. C104-79P and Motor Pad No. C35-44.
# Models P4E6SSG36-189 and P4E6SSH36-190 use Part No. C203-194SS.
† Models with "LV" suffix use Part No. 37400-0028S.

P4R and P4RA SERIES
DURA-GLAS II POOL PUMP
1 through 2-1/2 H.P. Models



REPAIR PARTS LIST

Key No.	Part Description	Qty.	Part No.
1	Motor	1	Chart at Right
2	Water Slinger	1	17351-0009
3	Seal Plate (includes Key Nos. 4 and 5)	1	C203-194P
4	"O" Ring	1	U9-228A
5	Shaft Seal	1	37400-0027S
6	Clamp Knob	1	C19-37A
7	Clamp	1	WC36-22
8	Impeller	1	Chart at Right
8A	Impeller Screw Assembly	1	17301-0151
9	Diffuser*	1	C1-271P1
10	Diffuser "O" Ring	1	U9-374
11	#8 Lock Washer	5	U43-21SS
12	Screw**	5	U30-922SS
13	Tank Body	1	C176-59P
14	Trap Cover	1	C3-185P
15	Trap "O" Ring	1	U9-375
16	Basket	1	C8-58P
17	1/4" NPT Drain Plug	2	U178-920P
18	Base Screw	2	U30-918SS
19	Base Washer	2	U43-41SS
20	Base w/Motor Pad	1	C104-78P
21	Motor Pad	1	C35-43
22	3/8-16 x 1" Hex Head Screw	4	U30-74SS
•	Decal "Suitable for outdoor use . . ."		U27-635
•	Voltage Sticker - 230 Volts		U27-68
•	Voltage Sticker - 115/230 Volts		U27-153
•	Tag, "CAUTION"		61002-0002
•	Tag, "CAUTION, WARNING (Bonding)		C63-12
•	Nameplate***		U33-174

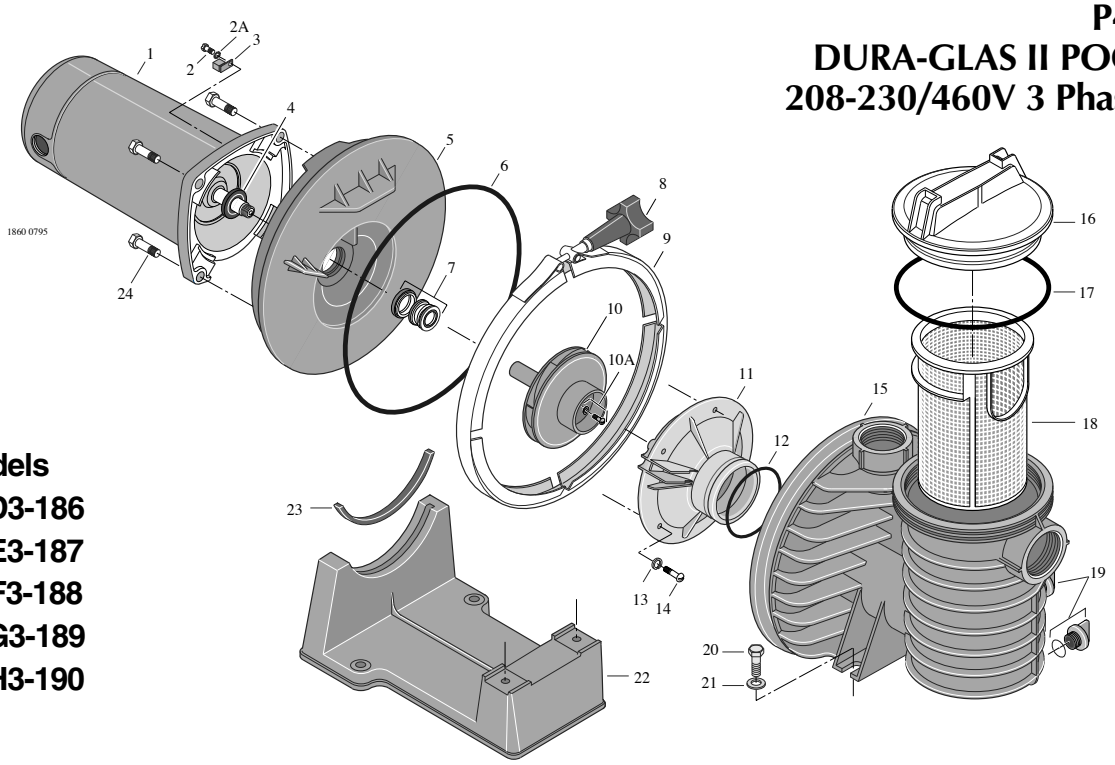
• Not illustrated.
* Models P4R6E, P4RA6E, P4RA6F and P4RA6YF use Part No. C1-271P1.
** Model P4R6E, P4RA6E, P4RA6F and P4RA6YF use Part No. U30-542SS.
*** Model P4R6E use Part No. 32155-4071.

Parts are common to all models listed except as noted; Key Nos. 1, Motor; and 10, Impeller are listed below.

Model No.	HP	Motor No. (Key No. 1)	Impeller No. (Key No. 10)
115/230 Volt			
P4RA6E-186L	1	A100ELL	C105-238P
P4R6E-187L	1	A100EHL	C105-238PB
P4RA6F-187L	1-1/2	A100FLL	C105-238PB
230 Volt			
P4R6F-188L	1-1/2	A100FHL	C105-238PDBA*
P4RAA6F-198L	1-3/4	A100F5LL	C105-238PDCA**
P4R6G-189L	2	AE100GHL	C105-238PEBA*
P4RA6G-188L	2	A100GHL	C105-238PDBA*
P4RAA6G-189L	2-1/2	AE100G5LL	C105-238PEBA*
230 Volt 2-Speed			
P4RA6YF-187L	1-1/2	A100FLL-Y	C105-238PB
P4RA6YG-188L	2	AE100GLL-Y	C105-238PDBA

*Uses #17301-0151 impeller screw assembly.
** Uses #37337-6080 impeller screw.

P4R SERIES
DURA-GLAS II POOL PUMP
208-230/460V 3 Phase Models



Models
P4R6D3-186
P4R6E3-187
P4R6F3-188
P4R6G3-189
P4R6H3-190

REPAIR PARTS LIST

Key No.	Part Description	Qty.	Part No.
1	Motor	1	Chart at Right
2	#10-32 x 1/2″ Screw	1	U30-692SS
2A	Lock Washer	1	U43-22SS
3	Bonding Lug(#)	1	U17-568
4	Water Slinger	1	17351-0009
5	Seal Plate (includes Key Nos. 6 and 7)	1	C203-194P
6	“O” Ring	1	U9-228A
7	Shaft Seal	1	37400-0027S
8	Clamp	1	C19-37A
9	Clamp Knob	1	WC36-22
10	Impeller	1	Chart at Right
10A	Impeller Screw Assembly*	1	17301-0151
11	Diffuser**	1	C1-271P
12	Diffuser “O” Ring	1	U9-374
13	#8 Lock Washer	5	U43-21SS
14	Screw†	5	U30-922SS
15	Tank Body	1	C176-59P
16	Trap Cover	1	C3-185P
17	Trap “O” Ring	1	U9-375
18	Basket	1	C8-58P
19	1/4″ NPT Drain Plug	2	U178-920P
20	Base Screw	2	U30-918SS
21	Base Washer	2	U43-41SS
22	Base w/Motor Pad***	1	C104-78P
23	Motor Pad***	1	C35-43
24	3/8-16 x 1″ Hex Head Screw	4	U30-74SS
•	Decal “Suitable for outdoor use . . .”		U27-635
•	Tag, “CAUTION”		61002-0002
•	Tag, “CAUTION, WARNING (Bonding)		C63-12
•	Nameplate		U33-174

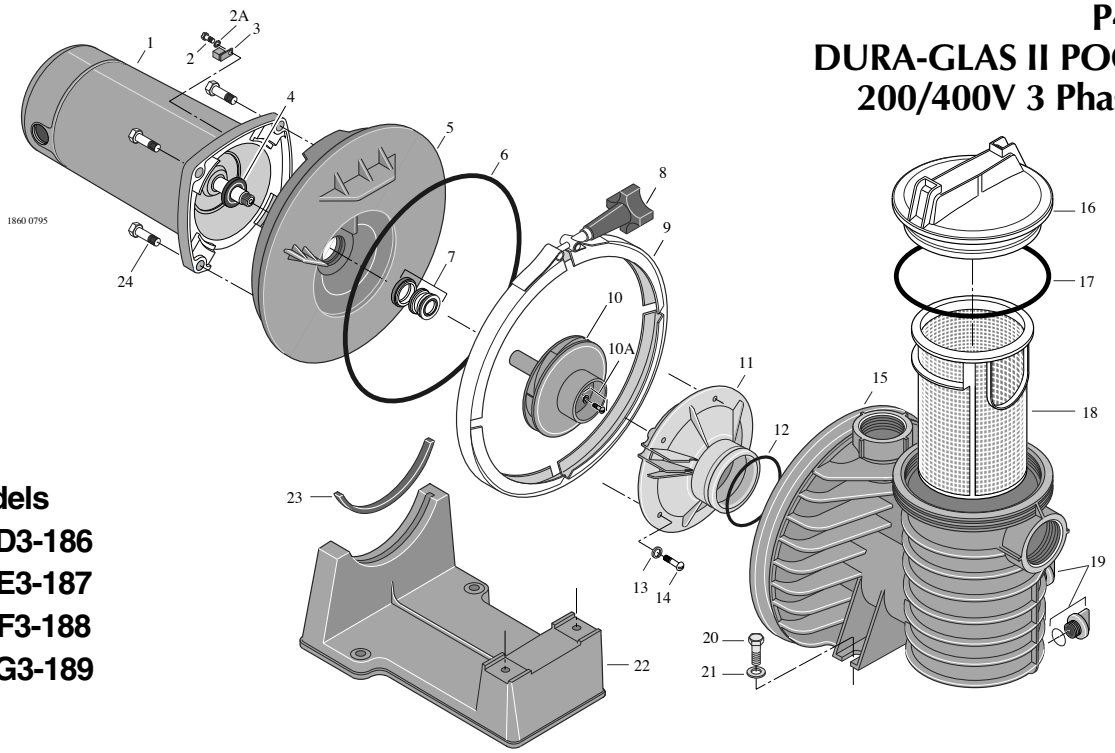
Parts are common to all models listed except as noted; Key Nos. 1, Motor; and 10, Impeller are listed below.

Model No.	HP	Motor No. (Key No. 1)	Impeller No. (Key No. 10)
208-230/460-3Ø			
P4R6D3-186	3/4	AP100DH	C105-238PA
P4R6E3-187	1	AP100EH	C105-238PBA
P4R6F3-188	1-1/2	AP100FH	C105-238PDBA
P4R6G3-189	2	AP100GH	C105-238PEBA
230/460-3Ø			
P4R6H3-190	3	AP100HL	C105-238PLA

*** Model P4R6H3 uses Base No. C104-79P and Pad No. C35-44.
† Models P4R6D3 and P4R6E3 use Part No. U30-542SS.

• Not illustrated.
* Model P4R6E3 uses Part No. 17301-0152.
** Models P4R6D3 and P4R6E3 use Part No. C1-271P1.
# Model P4R6H3-190 has no bonding lug assembly, Key Numbers, 2, 2A and 3.

P4R SERIES
DURA-GLAS II POOL PUMP
200/400V 3 Phase Models



Models
P4R62D3-186
P4R62E3-187
P4R62F3-188
P4R62G3-189

REPAIR PARTS LIST

Key No.	Part Description	Qty.	Part No.
1	Motor	1	Chart at Right
2	#10-32 x 1/2″ Screw	1	U30-856ZP
2A	Lock Washer	1	U43-22SS
3	Bonding Lug	1	U17-568
4	Water Slinger	1	17351-0009
5	Seal Plate (includes Key Nos. 6 and 7)	1	C203-194P
6	“O” Ring	1	U9-228A
7	Shaft Seal	1	37400-0027S
8	Clamp Knob	1	C19-37A
9	Clamp	1	WC36-22
10	Impeller	1	Chart at Right
10A	Impeller Screw Assembly*	1	17301-0151
11	Diffuser**	1	C1-271P
12	“O” Ring Diffuser	1	U9-374
13	#8 Lock Washer	5	U43-21SS
14	Screw***	5	U30-922SS
15	Tank Body	1	C176-59P
16	Trap Cover	1	C3-185P
17	Trap “O” Ring	1	U9-375
18	Basket	1	C8-58P
19	1/4″ NPT Drain Plug	2	U178-920P
20	Base Screw	2	U30-918SS
21	Base Washer	2	U43-41SS
22	Base w/Motor Pad	1	C104-78P
23	Motor Pad	1	C35-43
24	3/8-16 x 1″ Hex Head Screw	4	U30-74SS
•	Decal “Suitable for outdoor use . . .”		U27-635
•	Tag, “CAUTION”		61002-0002
•	Tag, “CAUTION, WARNING (Bonding)		C63-12
•	Nameplate		U33-174

Parts are common to all models listed except as noted; Key Nos. 1, Motor; and 10, Impeller are listed below.

Model No.	HP	Motor No. (Key No. 1)	Impeller No. (Key No. 10)
200/400V-3Ø			
P4R62D3-186L	3/4	AP100DH2	C105-238PA
P4R62E3-187	1	AP100EH2	C105-238PBA
P4R62F3-188	1-1/2	AP100FH2	C105-238PDBA
P4R62G3-189	2	AP100GH2	C105-238PEBA

• Not illustrated.
* Model P4R62E3-151 uses Part No. 17301-0152.
** Models P4R62D3, P4R62E3 use Part No. C1-271P1.
*** Models P4R62D3-150 and P4R62E3-151 use Part No. U30-542SS.

STA-RITE LIMITED WARRANTY

Pumps, filters, skimmers, underwater lights (except bulbs), accessories and fittings manufactured by Sta-Rite are warranted to be free of defects in material and workmanship for one (1) year from date of installation.

Product specific warranties:	**Year from date of installation**
HRPB, DEPB, System 3, System 2 and Posi-Clear	
Tanks	10 years
Internal filter components and valves	1 year
Max-E-Therm – Pool/Spa Heaters	2 years
Heater Enclosure only (Upper RH & LH; lower enclosure; and control board enclosure)	10 years
Automatic Pool Cleaners including Hose	2 years
Cristal-Flo filters – Tanks	10 years pro-rated*
Valve and internal components.	1 year
Posi-Flo II – Tanks	10 years
Elements	1 year
PRC Cartridge –	
Filter Tanks	5 years pro-rated (1st 2 years full)
Elements	1 year
System 2 Above Ground Systems – Tanks	10 years
Pumps / Platform and Internals	1 year
Pumps	1 year
When equipped with A.O. Smith 2-compartment motors (Does not include pumps sold as part of a systems package)	2 years
Traps / In-Line Strainers	1 year
Vertical Commercial Filter – Tanks	10 years
Internals	1 year
Horizontal Commercial Filter	
Tanks	5 years
(Years 6-9, Prorated declining 20%/year, Yr. 10 - 10%)	
Internals	1 year

* Full warranty coverage is in effect for one year after installation. The pro-rated warranty covers the *tank only* during the 2nd through 10th year after installation. The amount covered decreases by 10% each year. (ie., 2nd year 90% covered, 3rd year 80% covered, etc.).

The foregoing warranties relate to the original consumer purchaser ("Purchaser") only. Sta-Rite shall have the option to repair or replace the defective product, at its sole discretion. Purchasers must pay all labor and shipping charges necessary to replace the product covered by this warranty. Requests for warranty service must be made through the installing dealer. This warranty shall not apply to any product that has been subject to negligence, misapplication, improper installation or maintenance, or other circumstances which are not in Sta-Rite's direct control.

This warranty sets forth Sta-Rite's sole obligation and Purchaser's exclusive remedy for defective products.

STA-RITE SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL OR CONTINGENT DAMAGES WHATSOEVER.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS WARRANTIES. IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE DURATION OF THE APPLICABLE EXPRESS WARRANTIES PROVIDED HEREIN.

Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitations or exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Supersedes all previous publications.

Sta-Rite Industries, Inc.,
293 Wright St., Delavan, WI 53115

▲ **Retain Warranty Certificate (upper portion) in a safe and convenient location for your records.**

DETACH HERE: Fill out bottom portion completely and mail within 10 days of purchase/installation to:
▼ **Sta-Rite, Attn: Warranty Dept., 293 Wright St., Delavan, WI 53115**

STA-RITE®

Warranty Registration Card

Name

Address

City State Zip

Purchase Date

Product Purchased

☐ New installation ☐ Replacement

Type of Pool ☐ Inground ☐ Vinyl ☐ Fiberglass ☐ Gunite

Size of Pool

Years pool has been in service ☐ less than 1 ☐ 1-3 ☐ 3-5 ☐ 5-10

Purchased from:
Company name

Address

City State Zip

Please send me more information on these other products from Sta-Rite.

☐ Pumps ☐ Filters ☐ Automatic Pool Cleaners
☐ Maintenance Equipment ☐ Test Strips
☐ Heaters